Serial No.	H-V029-E-13

Butterfly Valves Type 55

User's Manual

Contents

(1) Be sure to read the following warranty clauses of our product 1

(2) General operating instructions 2

(3) General instructions for transportation, unpacking and storage 3

(4) Name of parts 4

(5) Working pressure vs. temperature 8

(6) Specification of limit switch 8

(7) Installation procedure 9

(8) Connection of limit switch procedure 12

(9) Operating procedure 13

(10) Disassembly and assembly procedure 14

(11) Adjustment procedure for stopper on gear type 15

(12) Inspection items 15

(13) Troubleshooting 16

(14) Handling of residual and waste materials 16

ASAHI *AV* VALVES

This user's guide contains information important to the proper installation, maintenance and safe use of an ASAHI AV Product. Please store this manual in an easily accessible location.

<Warning & Caution Signs>

Warning	This symbol reminds the user to take caution due to the potential for serious injury or death.
Caution	This symbol reminds the user to take caution due to the potential for damage to the valve if used in such a manner.

<Prohibited & Mandatory Action Signs>

	Prohibited: When operating the valve, this symbol indicates an action that should not be taken.
	Mandatory action: When operating the valve, this symbol indicates mandatory actions that must be adhered to.

(1) Be sure to read the following warranty clauses of our product

- Always observe the specifications of and the precautions and instructions on using our product.
- We always strive to improve product quality and reliability, but cannot guarantee perfection. Therefore, should you intend to use this product with any equipment or machinery that may pose the risk of serious or even fatal injury, or property damage, ensure an appropriate safety design or take other measures with sufficient consideration given to possible problems. We shall assume no responsibility for any inconvenience stemming from any action on your part without our written consent in the form of specifications or other documented approval.
- The related technical documents, operation manuals, and other documentation prescribe precautions on selecting, constructing, installing, operating, maintaining, and servicing our products. For details, consult with our nearest distributor or agent.
- Our product warranty extends for one and a half years after the product is shipped from our factory or one year after the product is installed, whichever comes first. Any product abnormality that occurs during the warranty period or which is reported to us will be investigated immediately to identify its cause. Should our product be deemed defective, we shall assume the responsibility to repair or replace it free of charge.
- Any repair or replacement needed after the warranty period ends shall be charged to the customer.
- The warranty does not cover the following cases:
  (1) Using our product under any condition not covered by our defined scope of warranty.
  (2) Failure to observe our defined precautions or instructions regarding the construction, installation, handling, maintenance, or servicing of our product.
  (3) Any inconvenience caused by any product other than ours.
  (4) Remodeling or otherwise modifying our product by anyone other than us.
  (5) Using any part of our product for anything other than the intended use of the product.
  (6) Any abnormality that occurs due to a natural disaster, accident, or other incident not stemming from something inside our product.

(2) General operating instructions

Warning

- Using a positive-pressure gas with our plastic piping may pose a dangerous condition due to the repellent force particular to compressible fluids even when the gas is under similar pressures used for liquids. Therefore, be sure to take the necessary safety precautions such as covering the piping with protective material. For inquiries, please contact us. For conducting a leak test on newly installed piping, be sure to check for leaks under water pressure. If absolutely necessary to use a gas in testing, please consult your nearest service station beforehand.
- When installing a valve, the AV gasket is basically unnecessary. But using a gasket gives more stable sealing ability in case of using a plastic flange, where easy occurrence of dent, mark or distortion can be expected.

Caution

- Do not step on or apply excessive weight on valve. (It can be damaged.)
- Do not use the valve in conditions where the fluid may have crystallized.
  (The valve will not operate properly.)
- Keep the valve away from excessive heat or fire. (It can be damaged, or destroyed.)
- Always operate the valve within the pressure vs. temperature range.
  (The valve can be damaged or deformed by operating beyond the allowable range.)
- Allow sufficient space for maintenance and inspection.
- Select a valve material that is compatible with the media. For chemical resistance information, refer to "CHEMICAL RESISTANCE ON ASAHI AV VALVE".
  (Some chemicals may damage incompatible valve materials.)
- Keep the valve out of direct sunlight, water and dust. Use cover to shield the valve.
  (The valve will not operate properly.)
- Perform periodic maintenance.
  (Leakage may develop due to temperature changes or periods of prolonged storage, rest, or operation.)
- Gear Operator Operation; we utilize a self-locking worm gear design on our manual operators. This design allows flow control of the valve in intermediate positions in normal process conditions. In applications where very high velocity, turbulence flow or vibration is present and an intermediate setting is required, it is recommended to install a locking device. The locking device will prevent the possibility of the valve drifting in severe condition form it is original intermediate setting.

Handle lock

(3) General instructions for transportation, unpacking and storage

Warning

- When suspending and supporting a valve, take care and do not stand under a suspended valve.

Caution

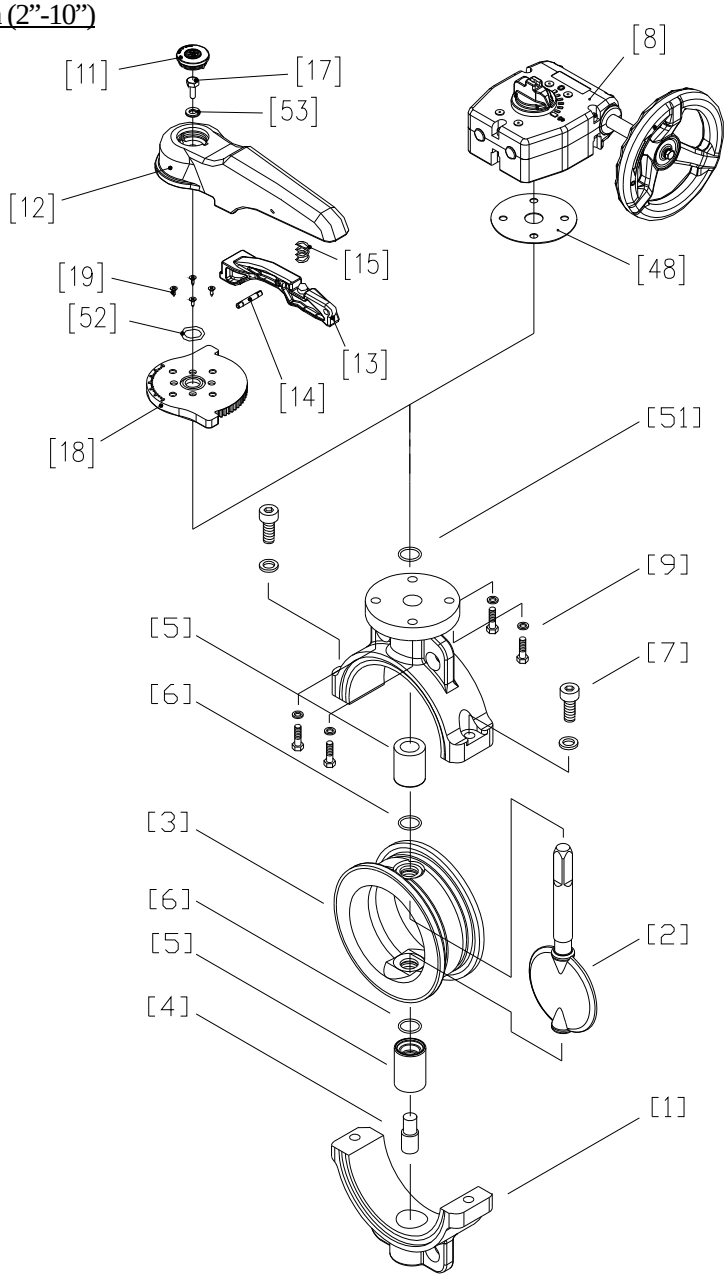
- This valve is not designed to handle impacts of any kind. Avoid throwing or dropping the valve.
- Avoid scratching the valve with any sharp object.
- Do not over-stack cardboard shipping boxes. Excessively stacked packages may collapse.
- Avoid contact with any coal tar creosote, insecticides, vermicides or paint.
  (These chemicals may cause damage to the valve.)
- When transporting a valve, do not carry it by the handle.

- Store products in their corrugated cardboard boxes. Avoid exposing products to direct sunlight, and store them indoors (at room temperature). Also avoid storing products in areas with excessive temperatures. (Corrugated cardboard packages become weaker as they become wet with water or other liquid. Take care in storage and handling.)
- After unpacking the products, check that they are defect-free and meet the specifications.

(4)Name of parts

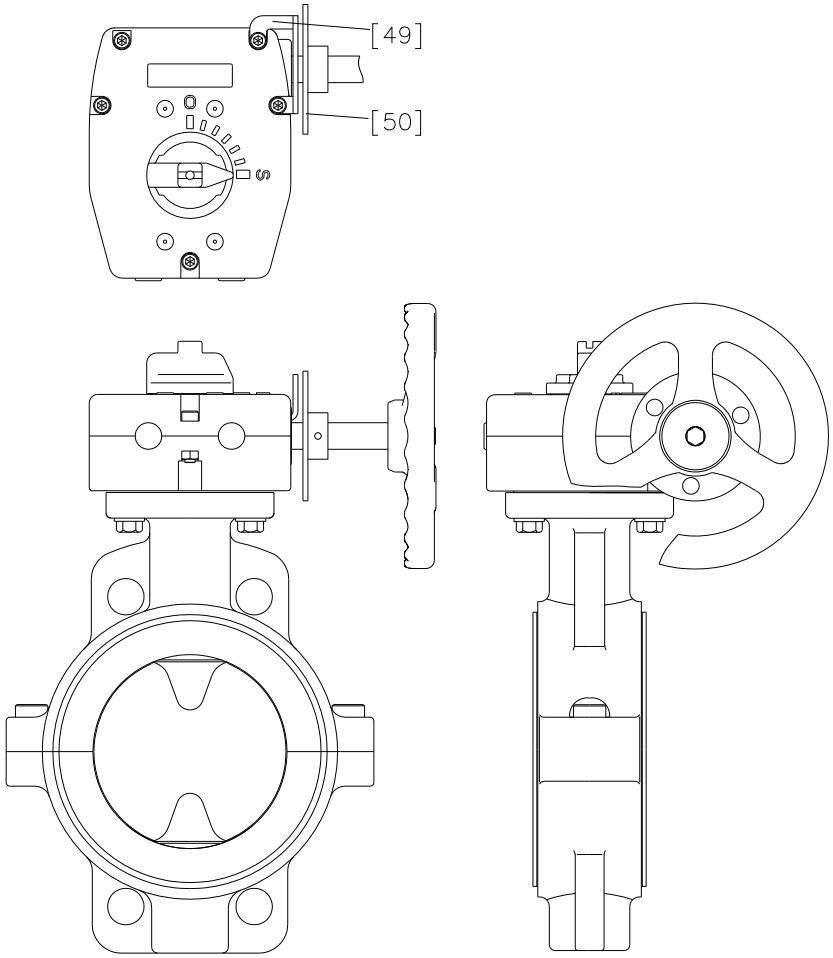
Lever Type 50-125mm (2”-5”)

Gear Type 50-250mm (2”-10”)



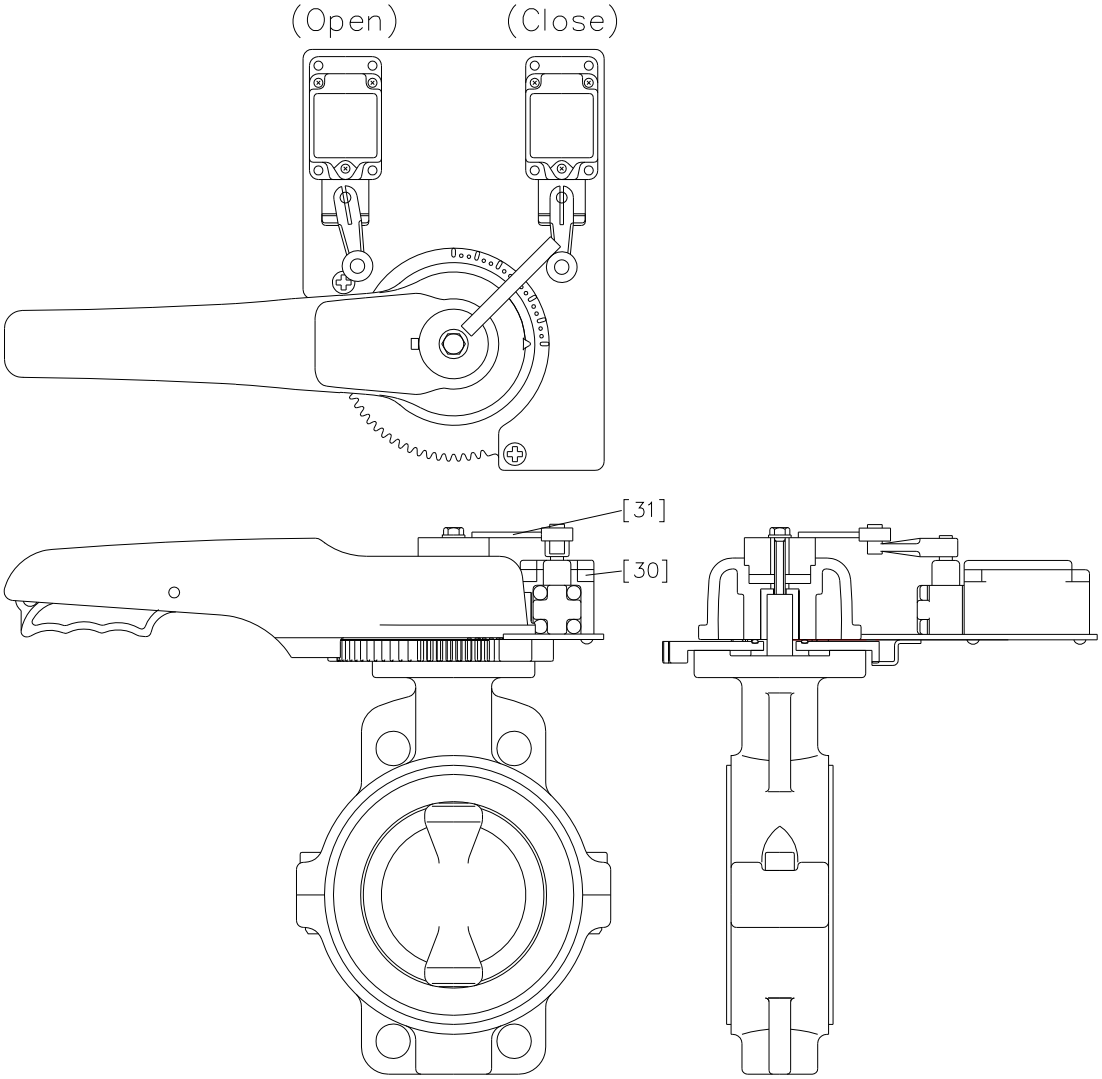
No.	DESCRIPTION	No.	DESCRIPTION	No.	DESCRIPTION
[1]	Body	[8]	Gear Box	[17]	Bolt (C)
[2]	Disc	[9]	Bolt (B)	[18]	Locking plate
[3]	Seat	[11]	Cap	[19]	Screw
[4]	Stem	[12]	Handle	[48]	Gasket (C)
[5]	Bush	[13]	Handle lever	[51]	O-ring (B)
[6]	O-ring (A)	[14]	Pin	[52]	O-ring (C)
[7]	Bolt (A)	[15]	Spring	[53]	Rubber + Washer

Gear Type 50-250mm (2”-10”) with Handle Lock (Option)



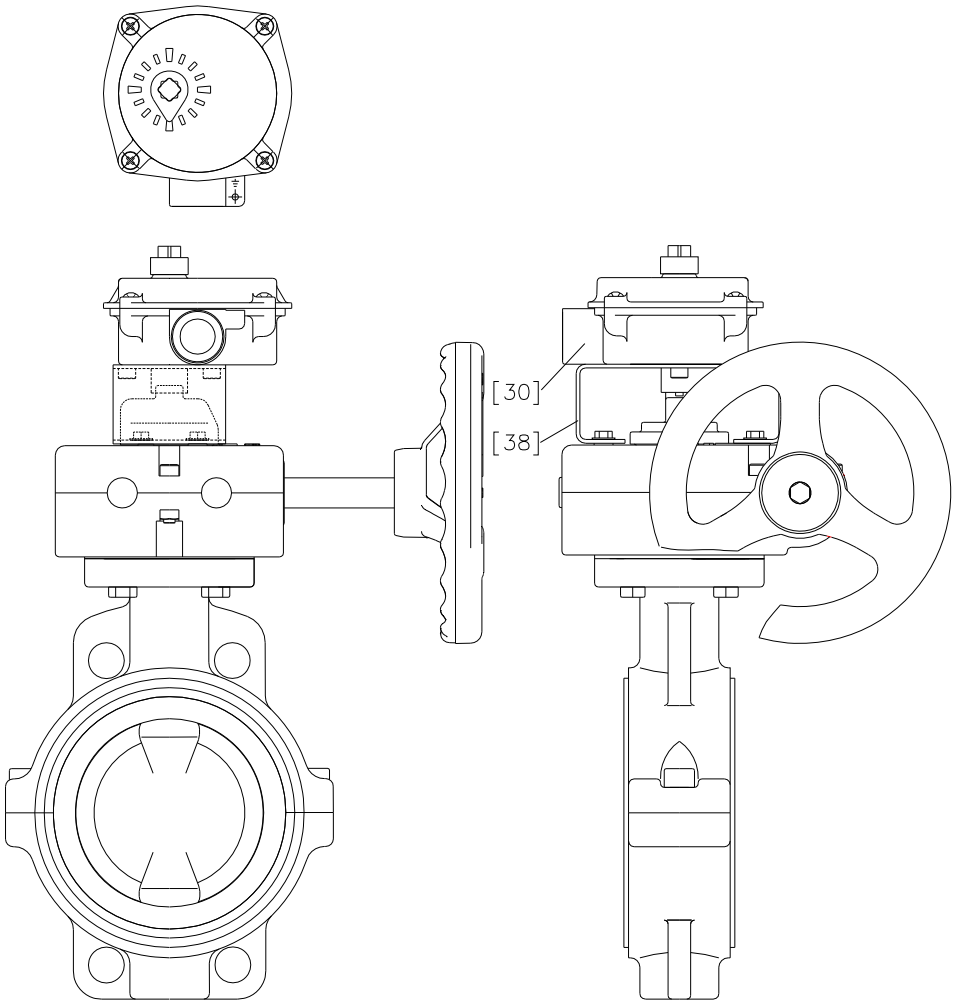
No.	DESCRIPTION
[49]	Lock Plate (A)
[50]	Lock Plate (B)

Lever Type 50-125mm (2”-5”) with Limit Switch (1LS1-J) (Option)



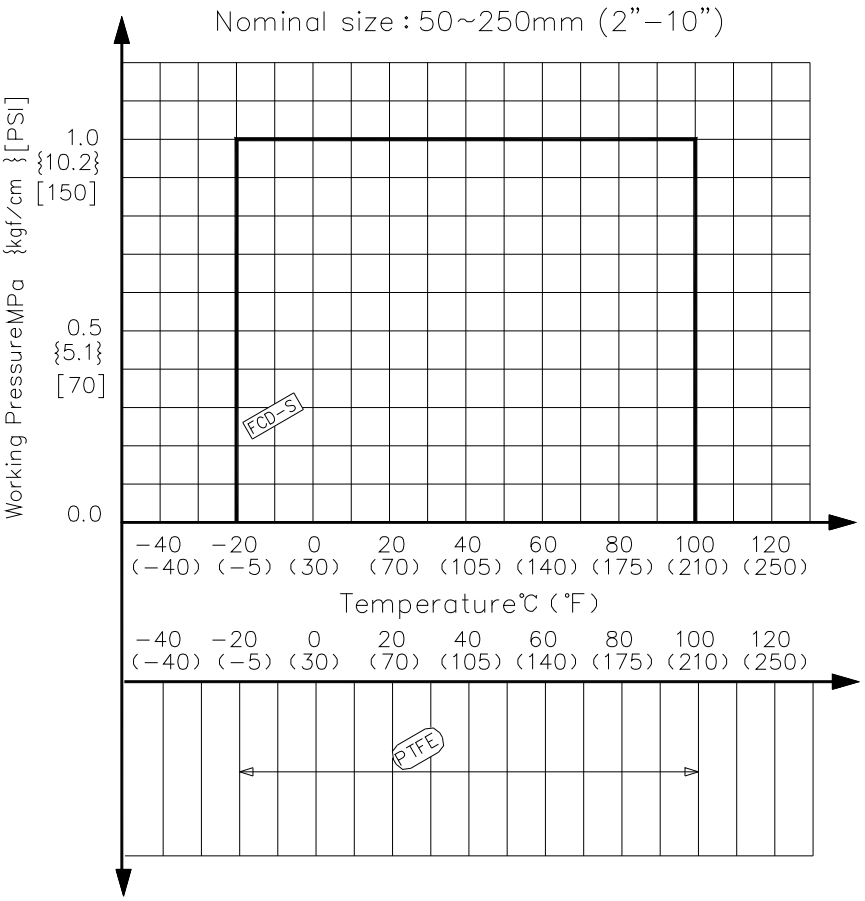
No.	DESCRIPTION
[30]	Limit Switch
[31]	Limit Switch Pushing Plate

Gear Type 50-250mm (2”-10”) with Limit Switch Box (TA2-SB2) (Option)



No.	DESCRIPTION
[30]	Limit Switch
[38]	Bracket (A)

(5) Working pressure vs. temperature



(6) Specification of limit switch

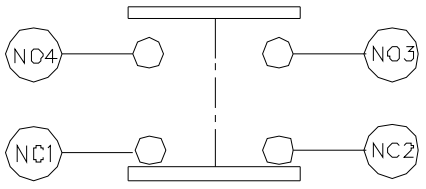
Nominal Size	Type	Type Code	Protection Grade
50-125mm (2"-5")	Lever Type	1LS1-J	IP67
50-250mm (2"-10")	Gear Type	TA2-SB2	IP65

Limit Switch Rating

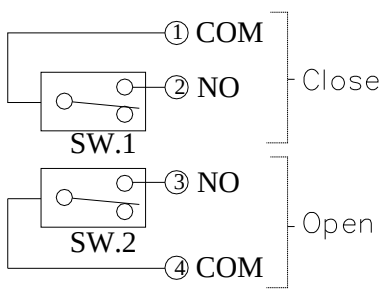
Type Code	Rate Voltage (V)	Resistive Load (A)	Inductive Load (A)
1LS1-J	AC125	10	6
	AC250	10	6
	DC115	0.8	0.2
	DC230	0.4	0.1
TA2-SB2	AC125	11	7
	AC250	11	7
	DC125	0.5	-
	DC250	0.25	-

Connection Diagram

1LS1-J



TA2-SB2



(7) Installation procedure

Warning

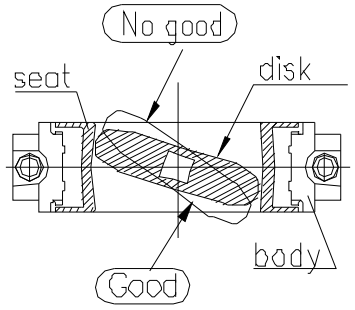
- When suspending and supporting a valve, take care and do not stand under a suspended valve.

- Be sure to conduct a safety check on all hand and power tools to be used before beginning work.
- Wear protective gloves and safety goggles as fluid remain in the valve even if the pipeline is empty. (You may be injured.)
- Do not install the valve with the disc fully closed. (The disc may pinch into the seat, resulting in a high operating torque and preventing the valve from operating properly.)
- When installing a valve, the AV gasket is basically unnecessary. But using a gasket gives more stable sealing ability in case of using a plastic flange, where easy occurrence of dent, mark or distortion can be expected.

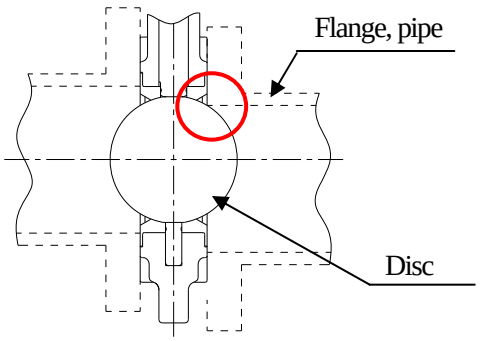
Caution

- When installing a pipe support by means of a U-band or something similar, take care not to over-tighten. (Excessive force may damage the pipe.)

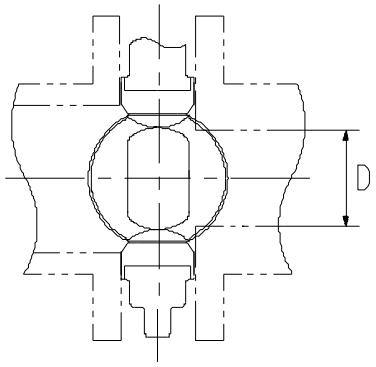
- When installing pipes and valves, ensure that they are not subjected to tension, compression, bending, impact, or other excessive stress.
- Use flat faced flanges for connection to AV Valves.
- Ensure that the mating flanges are of the same standards.
- The gasket is unnecessary. (The seat carries out the role of the gasket.)
- The valve disc is in the position indicated by solid lines in figure to the right prior to shipment from the factory. If the valve is opened or closed after unpacking, it must be reset in this position before installation. Failure to do so will result in damage to the surface of the valve seat during handling and installation.



- Care must be used during piping installation to ensure that the pipes or flanges are properly aligned so that the valve disc does not contact them in any setting. Misalignment as in figure below will result in damage to the valve.



In case of an abutting thick walled flange and pipe, shave the flange or the pipe inner diameter in order to avoid contact of pipe and disc. If the inside diameter of the connecting pipe is larger than dimension D below, shaving is not necessary.



Nominal size	Diameter D
50mm (2”)	43mm (1.69”)
80mm (3”)	68mm (2.68”)
100mm (4”)	89mm (3.50”)
125mm (5”)	116mm (4.57”)
150mm (6”)	140mm (5.51”)
200mm (8”)	177mm (6.97”)
250mm (10”)	234mm (9.21”)

Necessary items

- Torque wrench
- Spanner wrench
- Bolt, Nut, Washer
- AV gasket (If necessary)

<JIS 10K Standard>

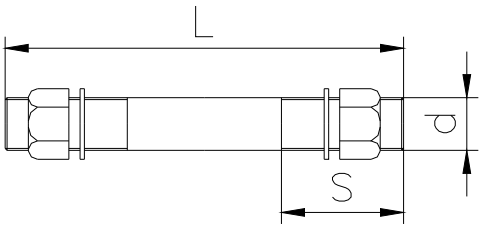
Dimension of Insert Bolt

Nom. Size		Bolt (Minimum)			Pieces	
mm	inch	d	L	S	Nut	Washer
50	2”	M16	130mm (5.11”)	35mm (1.38”)	4	8
80	3”		140mm (5.51”)		8	16
100	4”		145mm (5.71”)			
125	5”	M20	165mm (6.50”)	40mm (1.57”)		
150	6”		180mm (7.18”)			
200	8”		195mm (7.68”)		12	24
250	10”	M22	215mm (8.46”)			

<JIS 5K Standard>

Dimension of Insert Bolt

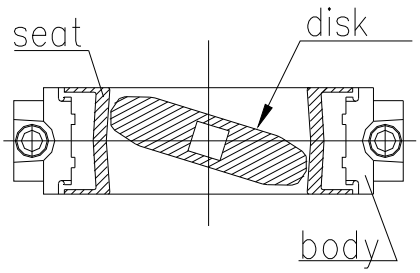
Nom. Size		Bolt (Minimum)			Pieces	
mm	inch	d	L	S	Nut	Washer
50	2”	M12	110mm (4.33”)	30mm (1.18”)	4	8
80	3”	M16	125mm (4.92”)	40mm (1.57”)	8	16
100	4”		135mm (5.31”)			
125	5”		140mm (5.51”)			
150	6”		155mm (6.10”)			
200	8”	M20	195mm (7.68”)	45mm (1.77”)		
250	10”		210mm (8.27”)		12	24



Procedure

1) Install the valve between flanges and open the valve slightly.

2) Insert bolts, set nuts and washer, then tighten temporarily the bolts and nuts by hand.

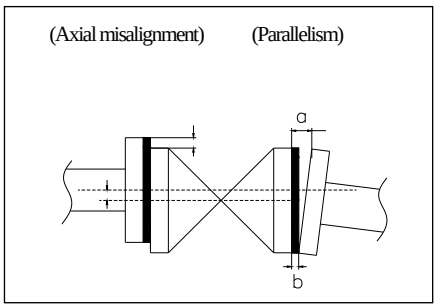


Caution

- The parallelism and axial misalignment of the flange surface should be under the values shown in the following table to prevent damage the valve.
(A failure to observe them can cause destruction due to stress application to the pipe)

Unit : mm (inch)

Nom. Size	Axial misalignment	Parallelism (a – b)
50, 80mm (2”, 3”)	1.0 (0.04)	0.8 (0.03)
100-150mm (4”-6”)	1.0 (0.04)	1.0 (0.04)
200, 250mm (8”, 10”)	1.5 (0.04)	1.5 (0.06)

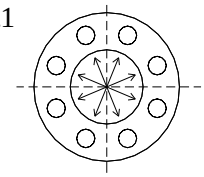


3) Tighten the bolts and nuts gradually with torque wrench to the specified torque in a diagonal manner. (Refer to Fig.1)

Caution

- Tighten the bolts and nuts gradually with a torque wrench to the specified torque level in a diagonal manner.

Fig.1



Recommended torque value Unit : N·m {kgf·cm} [lb·inch]

Nom. Size	50mm (2”)	80mm (3”)	100mm (4”)	125mm (5”)
Torque value	22.5 {230} [200]	30.0 {306} [266]	30.0 {306} [266]	40.0 {408} [355]

Nom. Size	150mm (6”)	200mm (8”)	250mm (10”)
Torque value	40.0 {408} [355]	55.0 {561} [488]	55.0 {561} [488]

(8) Connection of limit switch procedure

Warning - Shut down the power on the equipment before connecting wires. There are risks of electrical shock depending on the level of operating voltage.

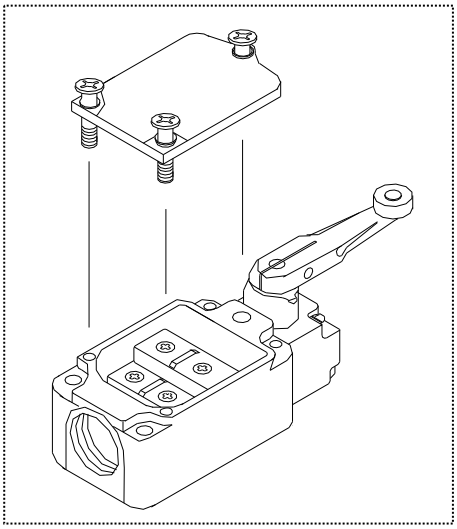
Caution - Be sure that the terminal cover and body cover are put on during the operation.

- If you use the limit switch at 1mA-100mA or 5-30V, consult near Asahi dealer.

Necessary items

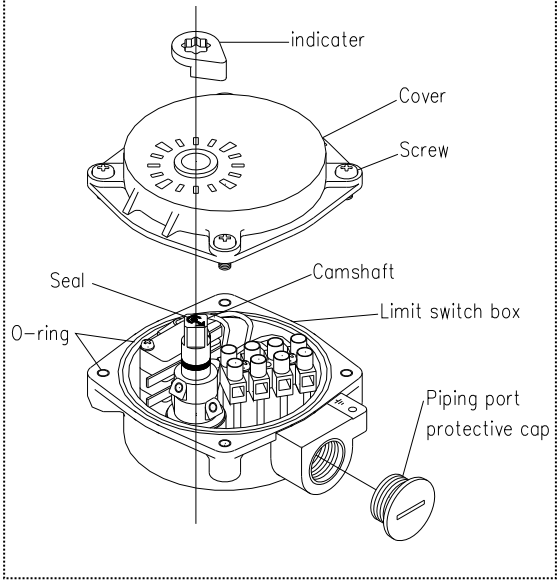
- Screw driver (+)
- Connector (G1/2)
- Crimp-style terminal
- Wire stripper
- Terminal crimping tool

Procedure (1LS1-J)



1) Loosen the three screws used to attach the limit switch cover with a screwdriver (+) and remove the cover from the limit switch.
   *These screws are captive.
2) Pull and remove the protective cap, made of resin, from the cover.
3) Draw the cable through the connector.
4) Strip the cable with a wire stripper.
5) Install a crimp-style terminal on the lead wire with a terminal crimping tool.
6) Connect the terminal screw with a screwdriver (+) according to the internal circuit diagram show in page 8.
   * Tighten the screws. (If not, electric leaks or shocks may occur.)
7) Tighten the above three screws with a screw driver (+) to install the cover on the limit switch.
8) Tighten the cable by connector.

Procedure (TA2-SB2)



1) Remove the indicator.
2) Remove the fixed screws from casing using screw driver (+).
   ※Don't be missing the o-ring of case end.
3) Turn to counter clockwise and remove the piping port protective cap.
4) Draw the cable through the connector.
5) Strip the cable with wire stripper.
6) Connect the cable to terminal board with a screw driver (-) in accordance page 8.
   ※Tighten the screws. (Short circuit or shocks may occur.)
7) Tighten up the connector to fix the cable.
8) The screws must be tightened in turn after set the casing with screws driver (+)
   ※Be sure to set the o-ring when the casing is re-set. (Short circuit or shocks may occur.)
9) Inset the indicator to the upper camshaft which must be set same direction of the seal's arrow.

(9) Operating procedure

Caution

- The installed valve must never be opened or closed when foreign matter such as sand is present in the pipeline.
- Do not exert excessive force in closing the valve.
- Do not use the valve to fluid containing slurry. (The valve will not operate properly.)
- When operating the handle, be sure to do so with your hand. (Using a tool may damage the handle.)

1) Open and close the valve by turning handle smoothly.
(Turn clockwise to close and counterclockwise to open.)

2) In case of lever type (50-125mm {2”-5”}), the direction of handle is same as the disc as shown in Fig.2.
   - For the full-shut position, the handle is perpendicular to the piping axis direction.
   - For the full-opened position, the handle is parallel to the piping axis direction.

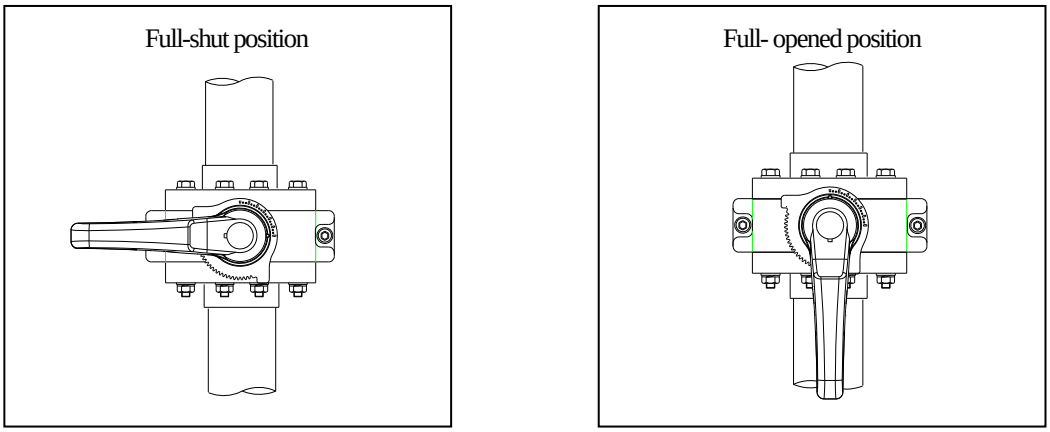


Fig.2

3) In case of gear type (50-250mm {2”-10”}), the indicator shows the position of the disc on the top of gearbox (Fig.3).
   - For the full-closed position, the indication shows Shut.
   - For the full-opened position, the indication shows Open.

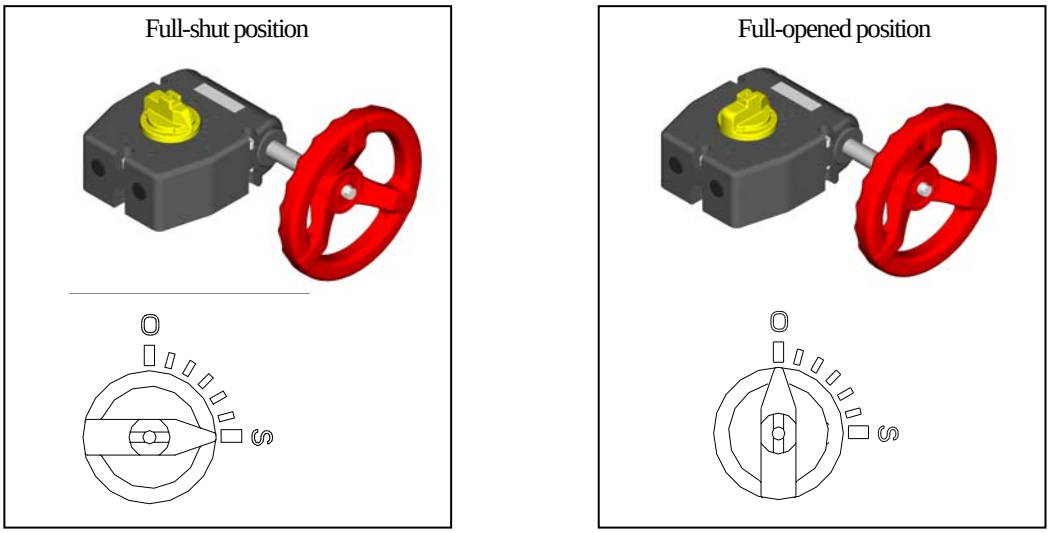


Fig. 3

(10) Disassembly and assembly procedure

Warning
- Wear protective gloves and safety goggles as fluid remain in the valve even if the pipeline is empty. (You may be injured.)
- When installing a valve, the AV gasket is basically unnecessary. But using a gasket gives more stable sealing ability in case of using a plastic flange, where easy occurrence of dent, mark or distortion can be expected.

Caution
- When installing pipes and valves, ensure that they are not subjected to tension, compression, bending, impact, or other excessive stress.
- Do not change or replace valve parts under line pressure.

Necessary items

- Protective gloves
- Goggles
- Spanner wrench
- Allen wrench
- Hammer
- Screw driver (-)
- Screw driver (+)
- Silicone grease
- AV gasket (If necessary)

<< **Disassembly** >>

Procedure

1) Drain fluid completely from the pipeline.
2) Leave the valve slightly opened.
3) Loosen the connecting bolts and nuts.
4) Remove the valve from the pipeline.
5) Lever Type

   To take off handle [12], first take off cap [11] by using screw driver (–) and release bolt (C) [17] by using socket wrench, then pull up the handle [12] by holding handle lever [13].

   To take off locking plate [18], release four tapping screws [19] first by using screwdriver (+).

   Gear Type

   Loosen set bolts (B) [9] for gearbox and pull out the gear box [8] upward.

<< **Assembly** >>

Procedure

1) The procedure of the assembly is the almost reverse of disassembly.
2) After assembly, make sure that the valve can be fully opened and closed smoothly.

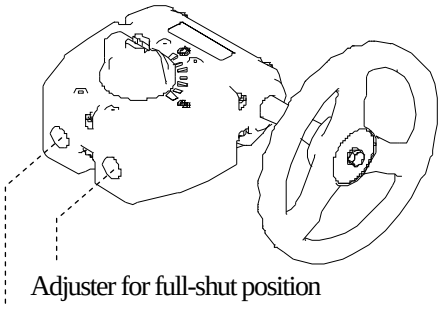
(11) Adjustment procedure for stopper on Gear Type

Necessary items
- Allen wrench

The adjustments for full-opened and full-shut position are step-less, and it can be done with the stopper adjuster.

Adjustment for Full-shut (Full-opened) position

1) Remove the rubber cap of Full-closing (Full-opening) adjuster.
2) Loosen the stopper hex-bolt with Allen wrench.
3) Adjust the disc of valve to required position.
4) Tighten the stopper hex-bolts.
5) Put the rubber cap of Full-closing (Full-opening) adjuster back on gearbox.



(12) Inspection items

Caution - Perform periodic maintenance. (Leakage may develop due to temperature changes or over periods of prolonged storage, rest or operation.)

Inspect the following items

(1)	Check for flaw, crack, or deformation on the valve.
(2)	Check for leaks to the outside.
(3)	Check for the deformation of seat due to improper installation of valve.
(4)	Check for the smoothness of handle operation.

(13) Troubleshooting

Phenomenon	Cause	Treatment
Fluid is not stopped in the full closed position at the seat.	1) The stopper is not set correctly. 2) The seat is damaged or worn. 3) Foreign materials are caught. 4) The disc is damaged or worn. 5) The connecting bolts are over tightened or tightened unevenly.	Adjust the stopper. Replace the valve. Clean it up. Replace the valve. Adjust and retighten.
Fluid leaks to the outside.	1) The seat is damaged or worn. 2) The connecting bolts are not tightened in proper torque or evenly.	Replace the valve. Adjust and retighten.
The handle does not work smoothly	1) Foreign materials have adhered. 2) The gear box is damaged. 3) The connecting bolt is over tightened.	Clean it up. Repair or replace. Adjust and retighten.
Valve does not operate	1) The gear box is damaged 2) The stem is damaged.	Repair or replace. Replace the valve.

(14) Handling of residual and waste materials

Warning

- Make sure to consult a waste treatment dealer for recommendations on the proper disposal of plastic valves. (Poisonous gas is generated when the valve is burned improperly.)

Butterfly Valves Type 55

ASAHI *AV* VALVES

Distributor

Asahi Organic Chemicals Industry's homepage http://www.asahi-yukizai.co.jp/en/

Information in this manual is subject to change without notice. 2012.01